



# CCTV cable 2 optical fibers, 3 Power cores, SHF1



**Store at :** -40 to +80 °C

**Install at :** -10 to +50 °C, **Bend minimum :** 25 (arm.) or 12 (non-arms.) times O.D.

**Operate at :** -40 to +80 °C, **Bend minimum :** 20 (arm.) or 15 (non-arms.) times O.D.

**Pull maximum :** 1000N

**Crush maximum :** 200N/100mm

## Design

### Fiber optic 2 Cores

**Fiber :** Fiber: 125/250µm SM or MM (see Fiber Characteristics datasheets)

**Buffer :** PBTP tube nominal diam 1.8mm filled with jelly (alternatively tight buffer design)

**Colour code** : 1.Natural 2.Red

**Protection** : Glass yarns (alternatively aramide yarns)

**Jacket** : LSZH Orange, nominal thickness 0.7mm, nominal outer Ø 3.5mm

### **Power, 3 cores 2.5mm<sup>2</sup>**

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup> (According to Class 5 IEC 60228, Ø of strands 0.25mm)

**Insulation** : cross linked polyethylene (XLPE) nominal Ø 3.5mm, colour coded (1.Brown, 2.Blue, 3.Green/Yellow)

**Conductor resistance @ 20°C** : ≤ 8.21 Ω/km

**Insulation resistance @ 20°C** : ≥ ≥ 1GΩ x km

**Operating Voltage** : 600/1000V

**Test Voltage** : 3500 V AC x 1 minute

### **Assembling**

**Cable core** : power and fiber elements stranded together around a central filler and wrapped by synthetic tape

**Inner jacket (outer for non-armoured version)** : non-corrosive thermoplastic compound, LSZH SHF1, nom. Ø 11.0mm, black colour

**Marking (non-armoured version)** : APS Finland - ww/yy - COMPOSITE CABLE 2xFO 3x2.5mm<sup>2</sup> - P/N - LSZH SHF1 IEC60332-3-22 Cat.A - lot + meter mark

**Armour** : galvanized steel wire armour, coverage ≥85%

**Outer jacket** : non-corrosive thermoplastic compound LSZH, nom. Ø 15.0mm, black colour

**Marking** : APS Finland - ww/yy - ARMoured COMPOSITE CABLE 2xFO 3x2.5mm<sup>2</sup> - P/N - LSZH SHF1 IEC60332-3-22 Cat.A - lot + meter mark

## Environmental properties and Fire Performances

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission** : IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$ )

**Toxicity of evolved gas** : EN 50305 9.2

**Flame retardant** : IEC 60332-1-2

**Fire retardant** : IEC 60332-3-22 Cat.A

**Oil resistant** : intermittent splash – permanent resistance available upon request

**Water penetration** : IEC 60794-1-2-F5-B (fiber unit), upon request for the whole inner core.

**UV resistant** : IEC60811-2-1, ASTM-D-2565-92A

## Ordering and delivery information

P/N	O.D [mm]	Weight [kg/km]	Packaging
OC3252xx1 non-armoured	11.0	370	drum 500m (+/-5%)
OC3252xxHF1 armoured	15.0	480	drum 500m (+/-5%)

xx = Fiber type : OS2=S2 - OM1=M1 - OM2=M2 - OM3=M3 - OM4=M4

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables
IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method

Every effort has been put so that this document is most reliable and free from errors. However, AP Solutions Oy cannot be considered responsible for any mistake in this document and users should consult AP Solutions Oy for any information needed.



# **CCTV cable 4 optical fibers, 3 Power cores, SHF1**



**Store at :** -40 to +80 °C

**Install at :** -10 to +50 °C, **Bend minimum :** 15 times O.D.

**Operate at :** -40 to +80 °C, **Bend minimum :** 12 times O.D.

**Pull maximum :** 1000N

**Crush maximum :** 200N/100mm

## Design

### Fiber optic 4 Cores

**Fiber :** Fiber: 125/250µm SM or MM (see Fiber Characteristics datasheets)

**Buffer :** PBTP tube nominal diam 1.8mm filled with jelly (alternatively tight buffer design)

**Colour code :** 1.Natural 2.Red 3.Green 4.Yellow

**Protection :** Glass yarns (alternatively aramide yarns)

**Jacket :** LSZH Orange, nominal thickness 0.7mm, nominal outer Ø 3.5mm

### Power, 3 cores 2.5mm<sup>2</sup>

**Conductor :** stranded tinned copper 2.5mm<sup>2</sup> (According to Class 5 IEC 60228, Ø of strands 0.25mm)

**Insulation :** cross linked polyethylene (XLPE) nominal Ø 3.5mm, colour coded (1.Brown, 2.Blue, 3.Green/Yellow)

**Conductor resistance @ 20°C :** ≤ 8.21 Ω/km

**Insulation resistance @ 20°C :** ≥ ≥ 1GΩ x km

**Operating Voltage :** 600/1000V

**Test Voltage :** 3500 V AC x 1 minute

## **Assembling**

**Cable core** : power and fiber elements stranded together around a central filler and wrapped by synthetic tape

**Inner jacket (outer for non-armoured version)** : non-corrosive thermoplastic compound, LSZH, nom. Ø 11.0mm, black colour

**Marking (non-armoured version)** : APS Finland - ww/yy - COMPOSITE CABLE OC3254\_H - LSZH IEC60332-3-22 Cat.A

**Armour** : galvanized steel wire armour, coverage  $\geq 85\%$

**Outer jacket** : non-corrosive thermoplastic compound LSZH, nom. Ø 15.0mm, black colour

**Marking** : APS Finland - ww/yy - ARMoured COMPOSITE CABLE OC3254\_HFH - LSZH IEC60332-3-22 Cat.A - lot + m

## **Environmental properties and Fire Performances**

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission** : IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$ )

**Toxicity of evolved gas** : EN 50305 9.2

**Flame retardant** : IEC 60332-1-2

**Fire retardant** : IEC 60332-3-22 Cat.A

**Oil resistant** : intermittent splash - permanent resistance available upon request

**Water penetration** : IEC 60794-1-2-F5-B (fiber unit), upon request for the whole inner core.

**UV resistant** : IEC60811-2-1, ASTM-D-2565-92A

## Ordering and delivery information

P/N	O.D [mm]	Weight [kg/km]	Packaging
OC3254xx1 non-armoured	11.0	370	drum 500m (+/-5%)
OC3254xxHF1 armoured	15.0	480	drum 500m (+/-5%)

xx = Fiber type : OS2=S2 - OM1=M1 - OM2=M2 - OM3=M3 - OM4=M4

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables
IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method



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# CCTV cable 75 Ohm coax RG59, Signal 2 pairs, Power 3×1.5, SHF1



**Store at :** -10 to +70 °C

**Install at :** -10 to +50 °C, **Bend minimum :** 20 x O.D.

**Operate at :** -34 to 80 °C, **Bend minimum :** 25 x O.D.

## Design

### Coaxial, 750hm RG59

**Inner conductor :** solid bare copper wire Class 1 0.58mm

**Dielectric :** polyethylene nominal Ø 3.70

**Braid :** bare copper, coverage ≥95%

**Sheath :** non-corrosive thermoplastic compound, Low Smoke Zero Halogen  
nominal Ø 6.15 mm

**Velocity :** 66%

**Capacitance :** 67 pF/m

**Resistance conductor :** 154 ± 5 Ω/km

**Resistance braid :** 9 ± 3 Ω/km

**Attenuation** : @ 500MHz 24.8 dB/100m

**Attenuation** : @ 1000MHz 35.6 dB/100m

**Attenuation** : @ 3000MHz 67.7 dB/100m

**Return Loss** : @ 3000MHz > 14.0 dB

## Signal, 2 pairs AWG24

**Conductor** : stranded tinned copper AWG24/7 strands

**Insulation** : polyethylene nominal thickness 0.40mm

**Assembling** : no 2 insulated conductors colour coded (1.White, 2.Black) stranded together into a pair.

**Screen** : aluminium/polyester tape 100% coverage with tinned copper drain wire

**Sheath** : non-corrosive thermoplastic compound, LSZH, nom. Ø 4.8mm, colour coded (1.Black 2.Grey)

**Resistance of conductor @ 20°C** : 90 Ω/km

**Insulation resistance @ 20°C** : ≥ 1000 MΩ x km

**Test Voltage** : 1000 V DC x 1 minute

## Power, 3 cores 1.5mm<sup>2</sup>

**Conductor** : stranded tinned copper 1.5mm<sup>2</sup>

**Insulation** : cross linked polyethylene nominal Ø 3.0mm, colour coded (1.Blue, 2.Brown, 3.Green/Yellow)

**Conductor resistance @ 20°C** : 12.1 Ω/km

**Insulation resistance @ 20°C** : ≥ 5000 MΩ x km

**Test Voltage** : 2000 V AC x 1 minute

## Assembling

**Cable core** : coaxial, signal and power elements stranded together into a compact core, with fillers and wrapping

**Inner jacket (outer for unarmoured version) :** SHF1 thermoplastic compound, nom. thickness 0.80mm, black colour

**Marking :** APS Finland - ww/yy - COMPOSITE CABLE OC75592P24315H - SHF1 IEC60332-3-24 - lot + m

### **Armoured version**

**Armour :** galvanized steel wire braid, coverage  $\geq 85\%$  (Alternatives : Bronze braid, Stainless steel braid)

**Outer jacket :** non-corrosive thermoplastic compound, SHF1, nom. thickness 1.50mm, black colour

**Marking :** APS Finland - ww/yy - ARMOURED COMPOSITE CABLE OC75592P24315HF2H - SHF1 IEC60332-3-24 - lot + m

## **Environmental properties and Fire Performances**

**Degree of acidity of gases :** IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas :** IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission :** IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$ )

**Toxicity of evolved gas :** EN 50305 9.2

**Flame retardant :** IEC 60332-1-2

**Fire retardant :** IEC 60332-3-24 Cat.C

**Oil resistant :** intermittent splash - permanent resistance available upon request

**Water penetration :** NO

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Unarmoured	OC75592P243151	17.0	380	drum 500m (+/-5%)
Armoured GSWB	OC75592P24315HF21	22.0	480	drum 500m (+/-5%)
Armoured GSWA	OC75592P24315HFA1	24.0	500	drum 500m (+/-5%)
Armoured Bronze braid	OC75592P24315HFB1	22.0	480	drum 500m (+/-5%)
Armoured St. Steel braid	OC75592P24315HSA1	24.0	540	drum 500m (+/-5%)

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
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IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables
IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method

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# CCTV cable 750hm coax 1xRG11 2P 3C SHF1 Fire Resistant



**Store at :** -40 to +70 °C

**Install at :** -10 to +50 °C, **Bend minimum :** 20 times O.D.

**Operate at :** -40 to +80 °C, **Bend minimum :** 20 times O.D

## Design

### Coaxial 750hm RG11

**Inner conductor :** stranded tinned copper 7×0.40mm

**Dielectric :** PE + Silicone Ø 7.25 ± 0.18 mm

**Braid :** bare copper, coverage 97%

**Sheath :** non-corrosive thermoplastic compound, Low Smoke Zero Halogen Ø  
10.3 ± 0.20 mm

**Velocity :** 67%

**Capacitance :** 67 pF/m

**Resistance conductor :** 20.5 Ω/km R

**Resistance braid** : 4.4  $\Omega$ /km

**Attenuation @ 1000MHz** : 23.4 dB/100m

**Attenuation @ 3000MHz** : 50.1 dB/100m

**Return Loss @ 900MHz** : > 20.0 dB

**Screening effectiveness** : > 20.0 dB

## Signal, 2 pairs AWG22

**Conductor** : stranded tinned copper AWG22/7 (0.88mm<sup>2</sup>)

**Insulation** : fire resistant tape + XLPE nominal  $\varnothing$  2.75

**Assembling** : no 2 insulated conductors colour coded (1.White, 2.Black) stranded together into a pair.

**Screen** : aluminium/polyester tape 100% coverage with tinned copper drain wire

**Sheath** : non-corrosive thermoplastic compound, LSZH, nom.  $\varnothing$  4.3mm, colour coded (1.Black 2.Blue)

**Resistance of conductor @ 20°C** :  $\leq$  90  $\Omega$ /km

**Insulation resistance @ 20°C** :  $\geq$  1000 M $\Omega$  x km

**Test Voltage** : 1000 V DC x 1 minute

## Power, 3 cores 2.5mm<sup>2</sup>

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup>

**Insulation** : fire resistant tape + cross linked polyethylene nominal  $\varnothing$  3.3mm, colour coded (1.Black, 2.Red, 3.Green/Yellow)

**Conductor resistance @ 20°C** :  $\leq$  7.98  $\Omega$ /km

**Insulation resistance @ 20°C** :  $\geq$  5000 M $\Omega$  x km

**Test Voltage** : 2000 V AC x 1 minute

## Assembling

**Cable core** : coaxial, signal and power elements stranded together into a compact



core, with fillers and wrapping

**Inner jacket (outer for unarmoured version) :** SHF1 thermoplastic compound, black colour (other colours upon request)

**Marking :** APS Finland - ww/yy - COMPOSITE CABLE OCX75112P223251 - SHF1 IEC60331-23 IEC60332-3-24 - lot + m

### **Armoured version**

**Armour :** galvanized steel wire braid, coverage  $\geq 80\%$  (alternatives : Bronze braid, Stainless steel braid)

**Outer jacket :** SHF1 thermoplastic compound, black colour (other colours upon request)

**Marking :** APS Finland - ww/yy - ARMOURED COMPOSITE CABLE "PN" - SHF1 IEC60331-23 IEC60332-3-24 - lot + m

## **Environmental properties and Fire Performances**

**Degree of acidity of gases :** IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas :** IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission :** IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$ )

**Toxicity of evolved gas :** EN 50305 9.2

**Flame retardant :** IEC 60332-1-2

**Fire retardant :** IEC 60332-3-24 Cat.C

**Fire resistant :** IEC 60331-23

**Oil resistant :** intermittent splash - permanent resistance available upon request

**Water penetration :** NO

**UV resistant :** IEC60811-2-1, ASTM-D-2565-92A

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Unarmoured	OCX75112P223251	18.0	480	drum 500m (+/-5%)
Armoured GSWB	OCX75112P223251F21	26.0	580	drum 500m (+/-5%)
Armoured GSWA	OCX75112P223251 FA1	27.0	620	drum 500m (+/-5%)
Armoured Bronze braid	OCX75112P223251 FB1	25.0	580	drum 500m (+/-5%)
Armoured St. Steel braid	OCX75112P22325 1SA1	27.0	620	drum 500m (+/-5%)

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
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IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables
IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method

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# CCTV cable 750hm coax 2xRG11 2P 2C SHF1 Fire Resistant



**Store at :** -40 to +70 °C

**Install at :** -10 to +50 °C, **Bend minimum :** 20 times O.D.

**Operate at :** -40 to +80 °C, **Bend minimum :** 20 times O.D

## Design

### Coaxial 2 x 750hm RG11

**Inner conductor :** stranded tinned copper 7×0.40mm

**Dielectric :** PE + Silicone Ø 7.25 ± 0.18 mm

**Braid :** bare copper, coverage 97%

**Wrapping :** non-migrating polyester tape

**Sheath :** non-corrosive thermoplastic compound, Low Smoke Zero Halogen Ø  
10.3 ± 0.20 mm

**Velocity :** 66%

**Capacitance :** 67 pF/m

**Resistance conductor** : 20.5  $\Omega$ /km R

**Resistance braid** : 4.5  $\Omega$ /km

**Attenuation @ 500MHz** : 15.5 dB/100m

**Attenuation @ 1000MHz** : 23.4 dB/100m

**Return Loss @ 900MHz** : > 20.0 dB

**Screening effectiveness** : > 25.0 dB

## 2 pairs AWG22

**Conductor** : stranded tinned copper AWG22/7 (0.88mm<sup>2</sup>)

**Insulation** : Mica+XLPE or silicon (nominal  $\varnothing$  3.00mm)

**Assembling** : no 2 insulated conductors colour coded (1.White, 2.Black) stranded together into a pair.

**Screen** : aluminium/polyester tape 100% coverage with tinned copper drain wire

**Sheath** : non-corrosive thermoplastic compound, LSZH, nom.  $\varnothing$  4.3mm, colour coded (1.Black 2.Blue)

**Resistance of conductor @ 20°C** :  $\leq$  90  $\Omega$ /km

**Insulation resistance @ 20°C** :  $\geq$  1000 M $\Omega$  x km

**Test Voltage** : 1000 V DC x 1 minute

## Power, 2 cores 2.5mm<sup>2</sup>

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup>

**Insulation** : Mica+XLPE or silicon nominal  $\varnothing$  3.5mm, colour coded (1.Black, 2.Red, 3.Green/Yellow)

**Conductor resistance @ 20°C** :  $\leq$  7.98  $\Omega$ /km

**Insulation resistance @ 20°C** :  $\geq$  5000 M $\Omega$  x km

**Test Voltage** : 2000 V AC x 1 minute

## Assembling

**Cable core** : coaxial, signal and power elements stranded together into a compact core, with fillers and wrapping

**Inner jacket (outer for unarmoured version)**: : SHF1 thermoplastic compound LSZH, Ø 17.5mm, black colour

**Marking** : APS Finland - ww/yy - ARMoured COMPOSITE CABLE OCX752112P223251 - IEC60331-23 IEC60332-3-24 - lot + m

### **Armoured version**

**Armour** : galvanized steel wire braid, coverage  $\geq 80\%$  (alternatives : Bronze braid, Stainless steel braid)

**Outer jacket** : SHF1 thermoplastic compound LSZH, black colour

**Marking** : APS Finland - ww/yy - ARMoured COMPOSITE CABLE OC7511P223251F1 - IEC60331-23 IEC60332-3-24 - lot + m

## **Environmental properties and Fire Performances**

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission** : IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$ )

**Toxicity of evolved gas** : EN 50305 9.2

**Flame retardant** : IEC 60332-1-2

**Fire retardant** : IEC 60332-3-24 Cat.C

**Fire resistant** : IEC 60331

**Oil resistant** : intermittent splash - permanent resistance available upon request

**Water penetration** : NO

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Unarmoured	OCX752112P223251	26.0	780	drum 500m (+/-5%)
Armoured GSWB	OCX752112P223251F21	29.0	950	drum 500m (+/-5%)
Armoured GSWA	OCX752112P223251 FA1	30.0	1100	drum 500m (+/-5%)
Armoured Bronze braid	OCX752112P223251 FB1	29.0	950	drum 500m (+/-5%)
Armoured St. Steel braid	OCX752112P22325 1SA1	29.0	980	drum 500m (+/-5%)

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
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IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables
IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method

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## **CCTV cable 750hm coax 2xRG11, 2xSignal, 2xPower SHF1 Armoured**





**Store at :** -40 to +70 °C

**Install at :** -10 to +50 °C, **Bend minimum :** 20 times O.D.

**Operate at :** -40 to +80 °C, **Bend minimum :** 20 times O.D

## Design

### Coaxial 2 x 750hm RG11

**Inner conductor :** stranded tinned copper 7×0.40mm

**Dielectric :** polyethylene Ø 5.25 ± 0.18 mm

**Braid :** bare copper, coverage 97%

**Wrapping :** non-migrating polyester tape

**Sheath :** non-corrosive thermoplastic compound, Low Smoke Zero Halogen Ø  
10.3 ± 0.20 mm

**Velocity :** 67%

**Capacitance :** 67 pF/m

**Resistance conductor :** 20.5 Ω/km R

**Resistance braid :** 4.4 Ω/km

**Attenuation @ 1000MHz :** 23.4 dB/100m

**Attenuation @ 3000MHz :** 50.1 dB/100m

**Return Loss @ 3000MHz :** > 20.0 dB

**Screening effectiveness :** > 20.0 dB

## Signal, 2 pairs AWG22

**Conductor** : stranded tinned copper AWG22/7 strands

**Insulation** : polyethylene nominal Ø 2.55

**Assembling** : no 2 insulated conductors colour coded (1.White, 2.Black) stranded together into a pair

**Screen** : aluminium/polyester tape 100% coverage with tinned copper drain wire

**Sheath** : non-corrosive thermoplastic compound, LSZH, nom. Ø 4.3mm, colour coded (1.Black 2.Blue)

**Resistance of conductor @ 20°C** :  $\leq 90 \Omega/\text{km}$

**Insulation resistance @ 20°C** :  $\geq 1000 \text{ M}\Omega \times \text{km}$

**Test Voltage** : 1000 V DC x 1 minute

## Power, 3 cores 2.5mm<sup>2</sup>

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup>

**Insulation** : cross linked polyethylene nominal Ø 3.0mm, colour coded (1.Black, 2.Red, 3.Green/Yellow)

**Conductor resistance @ 20°C** :  $\leq 7.98 \Omega/\text{km}$

**Insulation resistance @ 20°C** :  $\geq 5000 \text{ M}\Omega \times \text{km}$

**Test Voltage** : 2000 V AC x 1 minute

## Assembling

**Cable core** : coaxial, signal and power elements stranded together into a compact core, with fillers and wrapping

**Inner jacket (outer for unarmoured version)** : SHF1 thermoplastic compound LSZH, Ø 17.5mm, black colour

**Marking** : APS Finland - ww/yy - ARMOURED COMPOSITE CABLE OC7511P223251 - LSZH IEC60332-3-24 - lot + m

## **Armoured version**

**Armour** : galvanized steel wire braid, coverage  $\geq 80\%$  (alternatives : Bronze braid, Stainless steel braid)

**Outer jacket** : SHF1 thermoplastic compound LSZH, black colour

**Marking** : APS Finland - ww/yy - ARMoured COMPOSITE CABLE OC7511P223251F1  
- LSZH IEC60332-3-24 - lot + m

## **Environmental properties and Fire Performances**

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission** : IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$

**Toxicity of evolved gas** : EN 50305 9.2

**Flame retardant** : IEC 60332-1-2

**Fire retardant** : IEC 60332-3-24 Cat.C

**Oil resistant** : intermittent splash - permanent resistance available upon request

**Water penetration** : NO

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Unarmoured	OC752112P223251	26.0	drum 500m (+/-5%)	
Armoured GSWB	OC752112P223251F21	29.0	950	drum 500m (+/-5%)
Armoured GSWA	OC752112P223251 FA1	30.0	1100	drum 500m (+/-5%)
Armoured Bronze braid	OC752112P223251 FB1	29.0	950	drum 500m (+/-5%)
Armoured St. Steel braid	OC752112P22325 1SA1	29.0	980	drum 500m (+/-5%)

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.

CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables
IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method

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# CCTV cable 750hm coax 2xRG59, 2 Pairs, 2 cores 2.5 SHF1 Armoured



**Store at :** -10 to +70 °C

**Install at :** -10 to +50 °C, **Bend minimum :** 20 x O.D.

**Operate at :** -35 to +80 °C, **Bend minimum :** 25 x O.D.

## Design

**2 x 750hm RG59**

**Inner conductor :** solid bare copper wire Class 1 0.58mm

**Dielectric :** polyethylene nominal Ø 3.70

**Braid** : bare copper, coverage  $\geq 95\%$

**Sheath** : non-corrosive thermoplastic compound, Low Smoke Zero Halogen  
nominal  $\varnothing$  6.15 mm

**Velocity** : 66%

**Capacitance** : 67 pF/m

**Resistance conductor** :  $154 \pm 5 \Omega/\text{km}$

**Resistance braid** :  $9 \pm 3 \Omega/\text{km}$

**Attenuation @ 500MHz** : 24.8 dB/100m

**Attenuation @ 1000MHz** : 35.6 dB/100m

**Attenuation @ 3000MHz** : 67.7 dB/100m

**Return Loss @ 3000MHz** :  $> 14.0 \text{ dB}$

## Signal, 2 pairs AWG24

**Conductor** : stranded tinned copper AWG24/7 strands

**Insulation** : polyethylene nominal thickness 0.40mm

**Assembling** : no 2 insulated conductors colour coded (1.White, 2.Black)  
stranded together into a pair.

**Screen** : aluminium/polyester tape 100% coverage with tinned copper drain  
wire

**Sheath** : non-corrosive thermoplastic compound, LSZH, nom.  $\varnothing$  4.8mm, colour  
coded (1.Black 2.Grey)

**Resistance of conductor @ 20°C** :  $90 \Omega/\text{km}$

**Insulation resistance @ 20°C** :  $\geq 1000 \text{ M}\Omega \times \text{km}$

**Test Voltage** : 1000 V DC x 1 minute

## Power, 2 cores 2.5mm<sup>2</sup>

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup>

**Insulation** : cross linked polyethylene nominal  $\varnothing$  3.5mm, colour coded (1.Blue,  
2.Brown, 3.Green/Yellow)

**Conductor resistance @ 20°C** :  $\geq 8.21 \Omega/\text{km}$

**Insulation resistance @ 20°C** :  $\geq 5000 \text{ M}\Omega \times \text{km}$

**Test Voltage** : 2000 V AC x 1 minute

## Assembling

**Cable core** : coaxial, signal and power elements stranded together into a compact core, with fillers and wrapping

**Inner jacket (outer for unarmoured version)** : thermoplastic compound LSZH SHF1, nom. thick. 0.80mm, black

**Marking** : APS Finland - ww/yy - COMPOSITE CABLE OC752592P243251 - SHF1 IEC60332-3-24 - lot + m

## Armoured version

**Armour** : galvanized steel wire braid, coverage  $\geq 85\%$  (Alternatives : Bronze braid, Tinned Copper braid, Stainless steel wire)

**Outer jacket** : thermoplastic compound LSZH SHF1, nom. thickness 1.50mm, black colour

**Marking** : APS Finland - ww/yy - ARMoured COMPOSITE CABLE - P/N - SHF1 IEC60332-3-24 - lot + m

## Environmental properties and Fire Performances

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission** : IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$ )

**Toxicity of evolved gas** : EN 50305 9.2



**Flame retardant** : IEC 60332-1-2

**Fire retardant** : IEC 60332-3-24 Cat.C

**Oil resistant** : intermittent splash – permanent resistance available upon request

**Water penetration** : NO

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Unarmoured	OC752592P243251	16.5	420	drum 500m (+/-5%)
Armoured GSWB	OC752592P24325HF1	19.6	580	drum 500m (+/-5%)
Armoured GSWA	OC752592P24325HA1	21.0	630	drum 500m (+/-5%)
Armoured Bronze braid	OC752592P24325HB1	19.6	580	drum 500m (+/-5%)
Armoured St. Steel braid	OC752592P24325HS1	19.6	620	drum 500m (+/-5%)

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables
IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method

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# CCTV cable 750hm coax RG11 Signal 2 pairs Power 3 cores SHF1



**Store at:** -40 to +70 °C

**Install at:** -10 to +50 °C, **Bend minimum:** 20 times O.D.

**Operate at:** -40 to +80 °C, **Bend minimum:** 20 times O.D.

## Design

### Coaxial, 750hm RG11

**Inner conductor :** stranded tinned copper 7×0.40mm

**Dielectric :** polyethylene Ø 5.25 ± 0.18 mm

**Braid :** bare copper, coverage 97%

**Wrapping :** non-migrating polyester tape

**Sheath :** non-corrosive thermoplastic compound, Low Smoke Zero Halogen Ø  
10.3 ± 0.20 mm

**Velocity :** 67%

**Attenuation :** @ 1000MHz 23.4 dB/100m

**Capacitance** : 67 pF/m

**Attenuation** : @ 3000MHz 50.1 dB/100m

**Resistance conductor** : 20.5 Ω/km

**Return Loss** : @ 3000MHz > 20.0 dB

**Resistance braid** : 4.4 Ω/km

**Screening effectiveness** : > 20.0 dB

## Signal, 2 pairs AWG22

**Conductor** : stranded tinned copper AWG22/7 strands

**Insulation** : polyethylene nominal Ø 2.55

**Assembling** : no 2 insulated conductors colour coded (1.White, 2.Black) stranded together into a pair.

**Screen** : aluminium/polyester tape 100% coverage with tinned copper drain wire

**Sheath** : non-corrosive thermoplastic compound, LSZH, nom. Ø 4.3mm, colour coded (1.Black 2.Bue)

**Resistance of conductor @ 20°C** : ≤ 90 Ω/km

**Insulation resistance @ 20°C** : ≥ 1000 MΩ x km

**Test Voltage** : 1000 V DC x 1 minute

## Power, 3 cores 2.5mm<sup>2</sup>

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup>

**Insulation** : cross linked polyethylene nominal Ø 3.0mm, colour coded (1.Black, 2.Red, 3.Green/Yellow)

**Conductor resistance @ 20°C** : ≤ 7.98 Ω/km

**Insulation resistance @ 20°C** : ≥ 5000 MΩ x km

**Test Voltage** : 2000 V AC x 1 minute

## Assembling

**Cable core** : coaxial, signal and power elements stranded together into a compact core, with fillers and wrapping

**Inner jacket (outer for unarmoured version)** : SHF1 thermoplastic compound LSZH, Ø 17.5mm, black colour

**Marking** : APS Finland - ww/yy - ARMoured COMPOSITE CABLE OC7511P223251 - LSZH IEC60332-3-24 - lot + m

### **Armoured version**

**Armour** : galvanized steel wire armour, coverage  $\geq 80\%$  (alternatives : Bronze braid, Stainless steel braid)

**Outer jacket** : SHF1 thermoplastic compound LSZH, nom. Ø 25.0mm, black colour

**Marking** : APS Finland - ww/yy - ARMoured COMPOSITE CABLE OC7511P223251F1 - LSZH IEC60332-3-24 - lot + m

## **Environmental properties and Fire Performances**

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

Smoke Emission : IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$ )

**Toxicity of evolved gas** : EN 50305 9.2

**Flame retardant** : IEC 60332-1-2

**Fire retardant** : IEC 60332-3-24 Cat.C

**Oil resistant** : intermittent splash - permanent resistance available upon request

**Water penetration** : NO

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Unarmoured	OC75112P223251	17.5	480	drum 500m (+/-5%)
Armoured GSWB	OC75112P223251F21	25.0	580	drum 500m (+/-5%)
Armoured GSWA	OC75112P223251FA1	27.0	620	drum 500m (+/-5%)
Armoured Bronze braid	OC75112P223251FB1	25.0	580	drum 500m (+/-5%)
Armoured St. Steel braid	OC75112P223251SA1	27.0	620	drum 500m (+/-5%)

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
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IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables
IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method

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# CCTV cable 750hm coax RG11 Signal, 2 pairs, 3 Power cores LSZH



**Store at :** -40 to +70 °C

**Install at :** -10 to +50 °C, **Bend minimum :** 20 times O.D.

**Operate at :** -40 to +80 °C, **Bend minimum :** 20 times O.D.

## Design

### Coaxial, 750hm RG11

**Inner conductor :** stranded tinned copper 7×0.40mm

**Dielectric :** polyethylene Ø 7.25 ± 0.18 mm

**Braid** : bare copper, coverage 97%

**Wrapping** : non-migrating polyester tape

**Sheath** : non-corrosive thermoplastic compound, Low Smoke Zero Halogen Ø  
10.3 ± 0.20 mm

**Velocity** : 67%

**Capacitance** : 67 pF/m

**Resistance conductor** : 20.5 Ω/km

**Resistance braid** : 4.4 Ω/km

**Attenuation** : @ 1000MHz 23.4 dB/100m

**Attenuation** : @ 3000MHz 50.1 dB/100m

**Return Loss** : @ 3000MHz > 20.0 dB

**Screening effectiveness** : > 20.0 dB

## Signal, 2 pairs AWG22

**Conductor** : stranded tinned copper AWG22/7 Insulation : polyethylene nominal  
Ø 2.55

**Assembling** : no 2 insulated conductors colour coded (1.White, 2.Black)  
stranded together into a pair.

**Screen** : aluminium/polyester tape 100% coverage with tinned copper drain  
wire

**Sheath** : non-corrosive thermoplastic compound, LSZH, nom. Ø 4.3mm, colour  
coded (1.Black 2.Bue)

**Resistance of conductor @ 20°C** : ≤ 90 Ω/km

**Insulation resistance @ 20°C** : ≥ 1000 MΩ x km

**Test Voltage** : 1000 V DC x 1 minute

## Power, 3 cores 2.5mm<sup>2</sup>

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup>

**Insulation** : cross linked polyethylene nominal Ø 4.0mm, colour coded (1.Blue,

2.Brown, 3.Green/Yellow)

**Conductor resistance @ 20°C** :  $\leq 7.98 \Omega/\text{km}$

**Insulation resistance @ 20°C** :  $\geq 5000 \text{ M}\Omega \times \text{km}$

**Test Voltage** : 2000 V AC x 1 minute

## Assembling

**Cable core** : coaxial, signal and power elements stranded together into a compact core, with fillers and wrapping

**Inner jacket (outer for unarmoured version)** : SHF1 thermoplastic compound LSZH,  $\varnothing$  17.5mm, black colour

**Marking** : APS Finland - ww/yy - ARMoured COMPOSITE CABLE "PN" - SHF1 IEC60332-3-24 - lot + m

## Armoured version

**Armour** : galvanized steel wire braid, coverage  $\geq 80\%$  (alternatives : Bronze braid, Stainless steel braid)

**Outer jacket** : SHF1 thermoplastic compound LSZH, nom.  $\varnothing$  25.0mm, black colour

**Marking** : APS Finland - ww/yy - ARMoured COMPOSITE CABLE "PN" - SHF1 IEC60332-3-24 - lot + m

## Environmental properties and Fire Performances

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission** : IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$

**Toxicity of evolved gas** : EN 50305 9.2

**Flame retardant** : IEC 60332-1-2

**Fire retardant** : IEC 60332-3-24 Cat.C

**Oil resistant** : intermittent splash – permanent resistance available upon request

**UV resistant** : IEC60811-2-1, ASTM-D-2565-92A

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Unarmoured	OC75112P22325Z	17.5	480	drum 500m (+/-5%)
Armoured GSWB	OC75112P22325ZF21	25.0	580	drum 500m (+/-5%)
Armoured GSWA	OC75112P22325ZFA1	27.0	620	drum 500m (+/-5%)
Armoured Bronze braid	OC75112P22325ZFB1	25.0	580	drum 500m (+/-5%)
Armoured St. Steel braid	OC75112P22325ZSA1	27.0	620	drum 500m (+/-5%)

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables
IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method

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**CCTV cable 750hm coax RG59,**

# Signal 2 pairs, Power 3x2.5, SHF1



**Store at :** -10 to +70 °C

**Install at :** -10 to +50 °C, **Bend minimum :** 20 x O.D.

**Operate at :** -34 to 80 °C, **Bend minimum :** 25 x O.D.

## Design

### Coaxial, 75Ohm RG59

**Inner conductor :** solid bare copper wire Class 1 0.58mm

**Dielectric :** polyethylene nominal Ø 3.70

**Braid :** bare copper, coverage  $\geq 95\%$

**Sheath :** non-corrosive thermoplastic compound, Low Smoke Zero Halogen  
nominal Ø 6.15 mm

**Velocity :** 66%

**Capacitance :** 67 pF/m

**Resistance conductor :**  $154 \pm 5 \Omega/\text{km}$

**Resistance braid :**  $9 \pm 3 \Omega/\text{km}$

**Attenuation :** @ 500MHz 24.8 dB/100m

**Attenuation :** @ 1000MHz 35.6 dB/100m

**Attenuation :** @ 3000MHz 67.7 dB/100m

**Return Loss @ 3000MHz :** > 14.0 dB

## Signal, 2 pairs AWG24

**Conductor** : stranded tinned copper AWG24/7 strands

**Insulation** : polyethylene nominal thickness 0.40mm

**Assembling** : no 2 insulated conductors colour coded (1.White, 2.Black) stranded together into a pair.

**Screen** : aluminium/polyester tape 100% coverage with tinned copper drain wire

**Sheath** : non-corrosive thermoplastic compound, LSZH, nom. Ø 4.8mm, colour coded (1.Black 2.Grey)

**Resistance of conductor @ 20°C** : 90 Ω/km

**Insulation resistance @ 20°C** : ≥ 1000 MΩ x km

**Test Voltage** : 1000 V DC x 1 minute

## Power, 3 cores 2.5mm<sup>2</sup>

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup>

**Insulation** : cross linked polyethylene nominal Ø 3.0mm, colour coded (1.Blue, 2.Brown, 3.Green/Yellow)

**Conductor resistance @ 20°C** : 8.21 Ω/km

**Insulation resistance @ 20°C** : ≥ 1GΩ x km

**Test Voltage** : 2000 V AC x 1 minute

## Assembling

**Cable core** : coaxial, signal and power elements stranded together into a compact core, with fillers and wrapping

**Inner jacket (outer for unarmoured version)**: SHF1 thermoplastic compound, nom. thickness 0.80mm, black colour

**Marking** : APS Finland - ww/yy - COMPOSITE CABLE OC75592P24325H - SHF1 IEC60332-3-24 - lot + m



## **Armoured version**

**Armour** : galvanized steel wire braid, coverage  $\geq 85\%$  (Alternatives : Bronze braid, Stainless steel braid)

**Outer jacket** : non-corrosive thermoplastic compound, SHF1, nom. thickness 1.50mm, black colour

**Marking** : APS Finland - ww/yy - ARMOURED COMPOSITE CABLE  
OC75592P24325HF2H - SHF1 IEC60332-3-24 - lot + m

## **Environmental properties and Fire Performances**

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission** : IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$

**Toxicity of evolved gas** : EN 50305 9.2

**Flame retardant** : IEC 60332-1-2

**Fire retardant** : IEC 60332-3-24 Cat.C

**Oil resistant** : intermittent splash - permanent resistance available upon request

**Water penetration** : NO

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Unarmoured	OC75592P243251	17.0	380	drum 500m (+/-5%)
Armoured GSWB	OC75592P243251F21	22.0	480	drum 500m (+/-5%)
Armoured GSWA	OC75592P243251FA1	24.0	500	drum 500m (+/-5%)
Armoured Bronze braid	OC75592P243251FB1	22.0	480	drum 500m (+/-5%)
Armoured St. Steel braid	OC75592P243251SA1	24.0	540	drum 500m (+/-5%)

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables

IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method

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## **CCTV cable 750hm coax RG59,**

# Signal 2 pairs, Power 3x2.5, SHF2



**Store at :** -10 to +70 °C

**Install at :** -10 to +50 °C, **Bend minimum :** 20 x O.D.

**Operate at :** -40 to +80 °C, **Bend minimum :** 25 x O.D.

## Design

### Coaxial, 750hm RG59

**Inner conductor :** solid bare copper wire Class 1 0.58mm

**Dielectric :** polyethylene nominal Ø 3.70

**Braid :** bare copper, coverage  $\geq 95\%$

**Sheath :** non-corrosive thermoplastic compound, Low Smoke Zero Halogen  
nominal Ø 6.15 mm

**Velocity :** 66%

**Capacitance :** 67 pF/m

**Resistance conductor :**  $154 \pm 5 \Omega/\text{km}$

**Resistance braid :**  $9 \pm 3 \Omega/\text{km}$

**Attenuation :** @ 500MHz 24.8 dB/100m

**Attenuation :** @ 1000MHz 35.6 dB/100m

**Attenuation :** @ 3000MHz 67.7 dB/100m

**Return Loss :** @ 3000MHz > 14.0 dB

### Signal, 2 pairs AWG24

**Conductor** : stranded tinned copper AWG24/7 strands

**Insulation** : polyethylene nominal thickness 0.40mm

**Assembling** : no 2 insulated conductors colour coded (1.White, 2.Black) stranded together into a pair.

**Screen** : aluminium/polyester tape 100% coverage with tinned copper drain wire

**Sheath** : non-corrosive thermoplastic compound, LSZH, nom. Ø 4.8mm, colour coded (1.Black 2.Grey)

**Resistance of conductor @ 20°C** : 90 Ω/km

**Insulation resistance @ 20°C** : ≥ 1000 MΩ x km

**Test Voltage** : 1000 V DC x 1 minute

## Power, 3 cores 1.5mm<sup>2</sup>

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup>

**Insulation** : cross linked polyethylene nominal Ø 3.5mm, colour coded (1.Blue, 2.Brown, 3.Green/Yellow)

**Conductor resistance @ 20°C** : 8.21 Ω/km

**Insulation resistance @ 20°C** : ≥ 5000 MΩ x km

**Test Voltage** : 2000 V AC x 1 minute

## Assembling

**Cable core** : coaxial, signal and power elements stranded together into a compact core, with fillers and wrapping

**Inner jacket (outer for unarmoured version)**: crosslinked thermoplastic compound, LSZH SHF2, nom. thick. 0.80mm, black

**Marking** : APS Finland - ww/yy - COMPOSITE CABLE OC75592P243252 - SHF2 IEC60332-3-24 - lot + m

## Armoured version

**Armour** : galvanized steel wire braid, coverage  $\geq 85\%$  (Alternatives : Bronze braid, Tinned Copper braid, Stainless steel wire)

**Outer jacket** : crosslinked thermoplastic compound, LSZH SHF2, nom. thickness 1.50mm, black colour

**Marking** : APS Finland - ww/yy - ARMOURED COMPOSITE CABLE - P/N - SHF2 IEC60332-3-24 - lot + m

## **Environmental properties and Fire Performances**

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S}/\text{mm}$ )

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission** : IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$ )

**Toxicity of evolved gas** : EN 50305 9.2

**Flame retardant** : IEC 60332-1-2

**Fire retardant** : IEC 60332-3-24 Cat.C

**Ozone resistant** : IEC60811-2-1, DIN VDE 0472 part 805 B

**LSZH SHF2** : IEC60092-360

**Oil resistant** : IEC60811

**Water absorption** : IEC60811-1-3

**Water penetration** : NO

**UV resistant** : IEC60811-2-1, ASTM-D-2565-92A

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Unarmoured	OC75592P243252	16.0	380	drum 500m (+/-5%)
Armoured GSWB	OC75592P24325HF2	21.0	480	drum 500m (+/-5%)
Armoured GSWA	OC75592P24325HA2	23.0	500	drum 500m (+/-5%)
Armoured Bronze braid	OC75592P24325HB2	23.0	480	drum 500m (+/-5%)
Armoured St. Steel braid	OC75592P24325HS2	24.0	540	drum 500m (+/-5%)

## Other standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
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IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289 series	Communication cables - Specifications for test methods
MIL-C-17	General specification for radio frequency coaxial cables
IEC61196-1	Coaxial communication cables
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method

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# 75 Ohm Coaxial cable RG6 CCS double screen PVC



## Installation Features

**Store at** -10 to +50 °C

**Install at** -10 to +50 °C, **Bend minimum** : 20 times O.D.

**Operate at** : -0 to +60 °C, **Bend minimum** : 20 times O.D.

**Pull maximum** : 100N

## Design

**Conductor** : solid CCS 1.02mm

**Dielectric** : foam PE nominal Ø 4.60mm

**Screen 1** : bonded AL/P nominal Ø 4.75mm

**Screen 2** : Aluminium wire braid nominal coverage 60%

**Jacket** : black PVC material nominal Ø 6.86mm

**Marking :** APS Finland - ww/yy - 75 Ohm CATV RG6 CCS - P/N CCS6AB6VKB3 - lot - meter

## Environmental properties and Fire Performances

**Flame retardant :** IEC60332-1-2

## Electrical Characteristics

Characteristic impedance (Ohm)	75+/-3
Capacitance (pF/m)	52+/-2
Velocity of Propagation (%)	85.0
Return Loss (dB) 5-1000MHz	≥22

Frequency	Attenuation db/100ft	Attenuation dB/100 meter
55	1.6	5.2
187	2.8	9.3
211	3.1	10
400	4.1	13.5
500	4.6	15.0
750	5.6	18.5
860	6.1	20.0

1000	6.6	21.5
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## **Recommended connectivity**

BNC connectors : APS BNC75

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# **CCTV Composite cable Coax 75Ω RG6, Signal 2PR AWG22, Power**

## 4×2,5mm<sup>2</sup> MUD



### Installation Features

**Store at** -10 to +70 °C

**Install at** -10 to +50 °C

**Operate at** : -20 to +90 °C

**Bend minimum** : 20 times O.D.

**Bend minimum** : 20 times O.D.

**Pull maximum** : 1500N

### Design

#### Coaxial RG6

**Conductor** : bare copper 1×0.72mm

**Insulation** : polyethylene

**Screen** : double tinned copper braid coverage 95%

**Jacket** : Low Smoke Zero Halogen material

**Characteristic impedance** : 75 Ω

**Velocity** : 66%

#### Signal 2 pairs AWG22

**Conductor** : Tinned copper 19×0.15mm

**Insulation** : PVC. Colour code : 1.White, 2.Black.

**Pairing** : 2 conductors stranded together into a pair

**Screen :** Aluminium/polyester tape.

**Outer jacket :** Low Smoke Zero Halogen material (colour Black and Grey)

### **Power 4 conductors 2.5mm<sup>2</sup>, 300VAC**

**Conductor :** bare copper 50×0.25mm

**Insulation :** XLPE HF FR Polyolefin. Colour code : 1. Blue 2. Brown 3. Black 4. Green/Yellow.

### **Assembling**

**Cable core :** 1 coaxial, 2 x signal, 4 x power stranded together with fillers

**Screen :** Tinned Copper wire braid, min. coverage 80%.

**Inner jacket :** Low Smoke Zero Halogen material

**Armour :** Galvanized Steel Wire, coverage 85%

**Outer jacket :** Halogen free SHF-MUD PUR compound

**Marking :** APS Finland - ww/yy - CCTV cable RG6 - 2 PR AWG22 - 4×2.5mm<sup>2</sup> - P/N OC7562P22425HAH - LSZH SHF +90°C - CE - lot - meter

## **Environmental properties and Fire Performances**

**Degree of acidity of gases :** IEC 60754-1, IEC 60754-2

**Halogen acid gas :** IEC 60754-1, IEC 60754-2

**Toxicity of evolved gas :** EN 50305 9.2

**Flame retardant :** IEC 60332-1-2

**Ozone resistant :** IEC 11801

**Weather resistant :** IEC 11801

**Oil resistant :** IEC 11801

**UV resistant :** IEC60811-2-1, ASTM-D-2565-92A

## Ordering and delivery information

**P/N :** OC7562P22425HAU

**Outer diameter :** 24.4 ± 0.75mm

**Weight :** 620 kg/km

**Delivery length :** 500m ± 10%

## Standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.																				
IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.																				
CEI EN 50289	Communication cables - Specifications for test methods																				
MIL-C-17	General specification for radio frequency coaxial cables																				
IEC61196-1	Coaxial communication cables																				
EN 50290-2-23	Insulation materials for telecommunication cables																				
IEC 60811	Insulating and sheathing materials of electric cables - Test method																				

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# **CCTV Composite cable Fire Resistant 4xFO, Power 3x1,5mm<sup>2</sup>, SHF2-MUD**



## **Standards of reference**

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
IEC 60092-360	Electrical installations in ships: Insulating and sheating materials for shipboard and offshore units.

CEI EN 50289	Communication cables - Specifications for test methods
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method
IEC 60793	General specifications for both multimode and single-mode optical fibres
IEC 60794	General specifications for optical fibre cables

## Installation Features

**Store at** -40 to +70 °C

**Install at** -10 to +50 °C, **bend minimum** 20 times O.D.

**Operate at** : -40 to +90 °C, **bend minimum** : 20 times O.D.

**Pull maximum** : 1000N

## Design

### Fiber Optic, 4 cores

**Fiber:** 125/250µm SM or MM (see Fiber Characteristics datasheets)

**Buffer:** PBTP tube nominal diam 1.8mm filled with jelly

**Colour code:** 1.Natural 2.Red 3.Green 4.Yellow

**Fire barrier** : mica tape

**Protection:** Glass yarns (alternatively aramide yarns)

**Jacket:** LSZH Orange, nominal thickness 0.7mm, nominal outer Ø 4.0mm



## **Power 3 conductors 1.5mm<sup>2</sup>**

**Conductor** : stranded tinned copper 1.5mm<sup>2</sup>

**Insulation** : cross linked LSZH material type G10, nominal Ø 3.0mm, colour coded (1.Blue, 2.Brown, 3.Green/Yellow)

**Conductor resistance @ 20°C** : 12.1 Ω/km

**insulation resistance @ 20°C** : ≥ 5000 MΩ x km

**Test Voltage** : 2000 V AC x 1 minute

## **Assembling**

**Cable core** : power and fiber elements stranded together and wrapped by synthetic tape

**Jacket** : non-corrosive thermoplastic compound, LSZH, nom. Ø 11.0mm, black

**Armour** : galvanised steel, tinned copper or bronze braid, coverage ≥85%

**Outer jacket** : non-corrosive thermoset compound LSZH SHF2-MUD, nom. Ø 16.0mm, black colour

### **Marking (armoured version):**

APS Finland - ww/yy - FIRE RESISTANT GSWB ARMOURED COMPOSITE CABLE 4xOS2 + 3x1.5mm<sup>2</sup> - OC3254xxXHooU - MUD NEK606 IEC60331 IEC60332-3-22 Cat.A - lot - CE + meter

## **Environmental properties and Fire Performances**

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value ≥ 4,3 and Conductivity ≤10μS/mm)

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission ≤ 0.5%)

**Smoke Emission** : IEC 61034-2, EN 50268-2 (Transmittance) ≥ 60%)

**Toxicity of evolved gas** : EN50305 9.2

- Flame retardant :** IEC 60332-1-2
- Fire retardant :** IEC 60332-3-22 Cat.A
- Fire resistant :** IEC60331
- Ozone resistant :** IEC60811-2-1, DIN VDE 0472 part 805 B
- LSZH SHF2 :** IEC 60092-360
- Oil resistant :** IEC60811, IRM 903
- MUD resistant :** NEK606:2009, IEC60092-360
- Water absorption :** IEC60811-1-3
- UV resistant :** IEC60811-2-1, ASTM-D-2565-92A
- Cold bend & impact :** CSA C22.2

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Armoured GSWB	OC3154xxXHF2U	16.8	500	500m/1640ft drum (+/-5%)
Armoured GSWA	OC3154xxXHFAU	16.8	500	500m/1640ft drum (+/-5%)
Armoured Bronze	OC3154xxXHFBU	16.8	480	500m/1640ft drum (+/-5%)
Armoured Tinned Copper	OC3154xxXHFTU	16.8	450	500m/1640ft drum (+/-5%)

**XX = fiber type =** OS2 = S2, OM1=M1, OM2=M2, OM3=M3, OM4=M4.

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## CCTV Composite cable Fire Retardant 4xFO, 2 Pairs AWG24, 3x2.5mm<sup>2</sup>, LSZH



### Standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
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IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289	Communication cables - Specifications for test methods
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method
IEC 60793	General specifications for both multimode and single-mode optical fibres
IEC 60794	General specifications for optical fibre cables

## Installation Features

**Store at** -10 to +70 °C

**Install at** -10 to +50 °C, **bend minimum** 20 times O.D.

**Operate at** : -35 to +80 °C, **bend minimum** : 20 times O.D.

**Pull maximum** : 5000N

## Design

**Fiber Optic, 4 cores**

**Fiber:** 125/250µm SM or MM (see Fiber Characteristics datasheets)

**Buffer:** PBTP tube nominal diam 1.8mm filled with jelly

**Colour code:** 1.Natural 2.Red 3.Green 4.Yellow

**Protection:** Glass yarns (alternatively aramide yarns)

**Jacket:** LSZH Orange, nominal thickness 0.7mm, nominal outer Ø 3.5mm

## **Signal 2 pairs AWG24**

**Conductor** : stranded tinned copper AWG24/7 strands

**Insulation** : polyethylene nominal Ø 1.50

**Assembling** : no 2 insulated conductors colour coded (1.White, 2.Black) stranded together into a pair.

**Screen** : aluminium/polyester tape 100% coverage with tinned copper drain wire

**Sheath** : non-corrosive thermoplastic compound, LSZH, nom. Ø 4.4mm, colour coded (1.Black 2.Bue)

**Resistance of conductor @ 20°C** :  $\leq 90 \Omega/\text{km}$

**Insulation resistance @ 20°C** :  $\geq 1000 \text{ M}\Omega \times \text{km}$

**Test Voltage** : 1000 V DC x 1 minute

## **Power 3 conductors 2.5mm<sup>2</sup>**

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup>

**Insulation** : XLPE, nominal Ø 3.5mm, colour coded (1.Blue, 2.Brown, 3.Green/Yellow)

**Conductor resistance @ 20°C** :  $\leq 7.98 \Omega/\text{km}$

**insulation resistance @ 20°C** :  $\geq 1\text{G}\Omega \times \text{km}$

**Test Voltage** : 2000V AC x 1 minute

**Operating Voltage** : 300/500V

## **Assembling**

**Cable core** : optical fiber, signal and power elements stranded together into a compact core, with fillers and wrapping where necessary.

**Jacket** : LSZH thermoplastic compound, Ø 14.5mm, black colour

**Marking** : APS Finland - ww/yy - CCTV COMPOSITE CABLE 4x "fiber type" 2 PR AWG24 3x2.5mm<sup>2</sup> - OC4S22P24325H - LSZH IEC60332-3-24 Cat.C - lot + m

## Armoured version

**Armour** : galvanized steel wire armour, coverage  $\geq 85\%$  (alternatives : Bronze braid, Stainless steel braid)

**Outer jacket** : LSZH thermoplastic compound, nom.  $\varnothing$  18.5mm, black colour

**Marking** : APS Finland - ww/yy - ARMoured CCTV COMPOSITE CABLE 4x "fiber type" 2 PR AWG24 3x2.5mm<sup>2</sup> - P/N - LSZH IEC60332-3-24 Cat.C - lot + m

## Environmental properties and Fire Performances

**Degree of acidity of gases** : IEC 60754-1, IEC 60754-2 (pH value  $\geq 4,3$  and Conductivity  $\leq 10\mu\text{S/mm}$ )

**Halogen acid gas** : IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq 0.5\%$ )

**Smoke Emission** : IEC 61034-2, EN 50268-2 (Transmittance)  $\geq 60\%$ )

**Toxicity of evolved gas** : EN50305 9.2

**Flame retardant** : IEC 60332-1-2

**Fire retardant** : IEC 60332-3-24 Cat.C

## Ordering and delivery information

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Unarmoured	OC4xx2P24325H	14.5	380	drum 500m (+/-5%)

Cable type	P/N	O.D [mm]	Weight [kg/km]	Packaging
Armoured GSWB	OC4xx2P24325HFH	18.5	500	drum 500m (+/-5%)
Armoured GSWA	OC4xx2P24325HAH	18.5	500	drum 500m (+/-5%)
Armoured Bronze braid	OC4xx2P24325HBH	18.5	500	drum 500m (+/-5%)
Armoured St. Steel braid	OC4xx2P24325HSH	18.5	500	drum 500m (+/-5%)

**XX = fiber type =** OS2 = S2, OM1=M1, OM2=M2, OM3=M3, OM4=M4.

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# CCTV Composite cable Fire Retardant 4xFO, Power 3x2.5mm<sup>2</sup>, SHF2-MUD, Reinforced



## Standards of reference

IEC 60092-370	Electrical installations in ships: Guidance on the selection of cables for telecommunication and data.
IEC 60092-360	Electrical installations in ships: Insulating and sheathing materials for shipboard and offshore units.
CEI EN 50289	Communication cables - Specifications for test methods
EN 50290-2-23	Insulation materials for telecommunication cables
IEC 60811	Insulating and sheathing materials of electric cables - Test method
IEC 60793	General specifications for both multimode and single-mode optical fibres
IEC 60794	General specifications for optical fibre cables

## Installation Features

**Store at** -40 to +70 °C

**Install at** -10 to +50 °C, **bend minimum** 20 times O.D.

**Operate at** : -40 to +90 °C, **bend minimum** : 20 times O.D.



**Pull maximum** : 5000N

## Design

### Fiber Optic, 4 cores

**Fiber**: 125/250µm SM or MM (see Fiber Characteristics datasheets)

**Buffer**: PBTP tube nominal diam 1.8mm filled with jelly

**Colour code**: 1.Natural 2.Red 3.Green 4.Yellow

**Protection**: Glass yarns (alternatively aramide yarns)

**Jacket**: LSZH Orange, nominal thickness 0.7mm, nominal outer Ø 4.0mm

### Power 3 conductors 2.5mm<sup>2</sup>

**Conductor** : stranded tinned copper 2.5mm<sup>2</sup>

**Insulation** : XLPE, nominal Ø 3.5mm, colour coded (1.Blue, 2.Brown, 3.Green/Yellow)

**Conductor resistance @ 20°C** : ≤ 8.21 Ω/km

**insulation resistance @ 20°C** : ≥ 1GΩ x km

**Test Voltage** : 2000V AC x 1 minute

**Operating Voltage** : 300/500V

### Assembling

**Cable core** : 3 power conductors and 1 fiber element stranded together into a compact core

**Screen** : tinned copper wire braid (coverage ≥80%)

**Wrapping** : synthetic tape

**Reinforcing** : double layer of aramide yarns

**Inner jacket** : non-corrosive thermoplastic compound, LSZH, nom. Ø 13.0mm, black

**Armour** : galvanised steel, tinned copper or bronze braid, coverage ≥85%

**Outer jacket :** non-corrosive thermoset compound LSZH SHF2-MUD, black colour

**Marking (armoured version):**

APS Finland - ww/yy - ARMOURED REINFORCED COMPOSITE CABLE 4x... +  
3x2.5mm<sup>2</sup> - P/N - MUD NEK606 IEC60332-3-22 Cat.A - lot - CE + meter

## Environmental properties and Fire Performances

**Degree of acidity of gases :** IEC 60754-1, IEC 60754-2 (pH value  $\geq$  4,3 and Conductivity  $\leq$ 10 $\mu$ S/mm)

**Halogen acid gas :** IEC 60754-1, IEC 60754-2 (Halogen acid gas emission  $\leq$  0.5%)

**Smoke Emission :** IEC 61034-2, EN 50268-2 (Transmittance)  $\geq$  60%)

**Toxicity of evolved gas :** EN50305 9.2

**Flame retardant :** IEC 60332-1-2

**Fire retardant :** IEC 60332-3-22 Cat.A

**Ozone resistant :** IEC60811-2-1, DIN VDE 0472 part 805 B

**LSZH SHF2 :** IEC 60092-360

**Oil resistant :** IEC60811, IRM 903

**MUD resistant :** NEK606:2009, IEC60092-360

**Water absorption :** IEC60811-1-3

**UV resistant :** IEC60811-2-1, ASTM-D-2565-92A

**Cold bend & impact :** CSA C22.2

## Ordering and delivery information

<b>Cable type</b>	<b>P/N</b>	<b>O.D [mm]</b>	<b>Weight [kg/km]</b>	<b>Packaging</b>
Armoured GSWB	OC3254xxKSHF2U	19.8	590	500m/1640ft drum (+/-5%)
Armoured GSWA	OC3254xxKSHFAU	19.8	590	500m/1640ft drum (+/-5%)
Armoured Bronze	OC3254xxKSHFBU	19.8	580	500m/1640ft drum (+/-5%)
Armoured Tinned Copper	OC3254xxKSHFTU	19.8	550	500m/1640ft drum (+/-5%)

**XX = fiber type = OS2 = S2, OM1=M1, OM2=M2, OM3=M3, OM4=M4.**

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